



Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

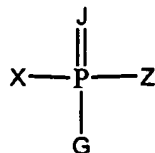
1. (currently amended) A method for decomposing a neutral organophosphorus compound, comprising:

subjecting said neutral organophosphorus compound to an alcoholysis reaction in a substantially non-aqueous medium comprising non-radioactive metal ions selected from the group consisting of lanthanide series metal ions, transition metal ions, and combinations thereof, and ~~at least a trace amount of~~ alkoxide ions[.];

wherein said alkoxide ions are present in a range from a trace amount to a metal ion:alkoxide ion ratio of 1:2; and

wherein, through said alcoholysis reaction, said neutral organophosphorus compound is decomposed.

2. (previously presented) The method of claim 1, wherein said organophosphorus compound has the following formula (10):



(10)

where:

J is O or S;

X, G, Z are the same or different and are selected from the group consisting of Q, OQ, QA, OA, F, Cl, Br, I, QS, SQ, SA and C≡N,

wherein at least one of X, G, Z is not Q or QA;

Q is a substituted or unsubstituted branched, straight-chain or cyclic alkyl group having 1-100 carbon atoms; and

A is a substituted or unsubstituted moiety selected from the group consisting of phenyl,

biphenyl, benzyl, pyridyl, naphthyl, polynuclear aromatic, and aromatic and non-aromatic heterocyclic; and

wherein said substituents are selected from the group consisting of Cl, Br, I, F, nitro, nitroso, Q, alkenyl, OQ, carboxyalkyl, acyl, SO₃H, SO₃Q, S=O(Q), S(=O)₂Q, amino, alkylamino (NHQ), arylamino (NHA), alkylaryl amino, dialkylamino and diarylamino.

3. (original) The method of claim 1, wherein said medium is a solution further comprising a solvent selected from the group consisting of methanol, substituted and unsubstituted primary, secondary and tertiary alcohols, alkoxyalkanol, aminoalkanol, and combinations thereof.

4. (original) The method of claim 1, wherein said organophosphorus compound has at least one phosphorus atom double bonded to an oxygen or a sulfur atom.

5. (original) The method of claim 1, wherein said medium further comprises a non-inhibitory buffering agent.

6. (original) The method of claim 5, wherein said buffering agent is selected from the group consisting of anilines, N-alkylanilines, N,N-dialkylanilines, N-alkylmorpholines, N-alkylimidazoles, 2,6-dialkylpyridines, primary, secondary and tertiary amines, trialkylamines, and combinations thereof.

7. (original) The method of claim 1, wherein said medium is a solution further comprising a solvent selected from the group consisting of methanol, ethanol, n-propanol, *iso*-propanol, n-butanol, 2-butanol, methoxyethanol, and combinations thereof.

8. (original) The method of claim 7, wherein said solution further comprises a solvent selected from the group consisting of nitriles, esters, ketones, amines, ethers, hydrocarbons, substituted hydrocarbons, unsubstituted hydrocarbons, chlorinated hydrocarbons, and

combinations thereof.

9. (currently amended) The method of claim 1, wherein ~~said medium further comprises the metal ion:alkoxide ion[[s]] in addition to said at least a trace amount of alkoxide ions~~ ratio is in a range from 1:0.01 to 1:2.

10. (currently amended) The method of claim [[9]] 1, wherein the ~~concentration of metal ion:said alkoxide ion[[s]] ratio is about 0.1 to about 2 equivalents of the concentration of the metal ions~~ in a range from 1:0.1 to 1:2.

11. (currently amended) The method of claim [[9]] 1, wherein the ~~concentration of metal ion:said alkoxide ion[[s]] ratio is about 1 to about 1.5 equivalents of the concentration of the metal ions~~ in a range from 1:1 to 1:1.5.

12. (original) The method of claim 1, wherein said medium is prepared by combining a metal salt and an alkoxide salt with at least one of alcohol, alkoxyalkanol and aminoalkanol.

13. (cancelled)

14. (original) The method of claim 1, wherein said metal ions are selected from the group consisting of lanthanide series metal ions, copper, platinum, palladium, zinc, nickel, yttrium, scandium ions, and combinations thereof.

15. (original) The method of claim 1, wherein said metal ions are selected from the group consisting of Cu^{2+} , Pt^{2+} , Pd^{2+} , Zn^{2+} , Y^{3+} , Sc^{3+} , Ce^{3+} , La^{3+} , Pr^{3+} , Nd^{3+} , Sm^{3+} , Eu^{3+} , Gd^{3+} , Tb^{3+} , Dy^{3+} , Ho^{3+} , Er^{3+} , Tm^{3+} , Yb^{3+} , and combinations thereof.

16. (original) The method of claim 1, wherein said metal ions are lanthanide series

metal ions.

17. (original) The method of claim 16, wherein said lanthanide series metal ions are selected from the group consisting of Ce^{3+} , La^{3+} , Pr^{3+} , Nd^{3+} , Sm^{3+} , Eu^{3+} , Gd^{3+} , Tb^{3+} , Dy^{3+} , Ho^{3+} , Er^{3+} , Tm^{3+} , Yb^{3+} , and combinations thereof.

18. (original) The method of claim 1, wherein said metal ions are selected from the group consisting of Cu^{2+} , Pt^{2+} , Pd^{2+} , Zn^{2+} , and combinations thereof.

19. (original) The method of claim 1, wherein said metal ions are selected from the group consisting of Y^{3+} , Sc^{3+} , and combinations thereof.

20. (original) The method of claim 1, wherein said metal ion is La^{3+} .

21. (original) The method of claim 1, wherein said organophosphorus compound is a pesticide.

22. (original) The method of claim 1, wherein said organophosphorus compound is an insecticide.

23. (currently amended) The method of claim 1, wherein said organophosphorus compound is selected from paraoxon, fenitrothion, parathion, malathion, and $(\text{C}_2\text{H}_5\text{O})_2\text{P}(\text{O})\text{-S-}$ (*p*-nitrophenyl).

24. (original) The method of claim 1, wherein said organophosphorus compound is a chemical warfare agent.

25. (original) The method of claim 24, wherein said organophosphorus compound is a

G-agent.

26. (currently amended) The method of claim 24, wherein said organophosphorus compound is selected from the group consisting of $C_2H_5-O-P(O)(CH_3)-S(CH_2)_2N(i\text{-propyl})_2$ ("VX") and $(i\text{-propyl})CH_2-O-P(O)(CH_3)-S(CH_2)_2N(C_2H_5)_2$ ("Russian-VX") ~~VX and Russian-VX.~~

27. (original) The method of claim 24, wherein said organophosphorus compound is a nerve agent.

28. (original) The method of claim 24, wherein said chemical warfare agent is combined with a polymer.

29. (original) The method of claim 1, wherein said medium further comprises one or more ligands.

30. (original) The method of claim 29, wherein said ligand is selected from the group consisting of 2,2'-bipyridyl, 1,10-phenanthryl, 2,9-dimethylphenanthryl, crown ether, and 1,5,9-triazacyclododecyl.

31. (original) The method of claim 29, wherein said ligand further comprises solid support material.

32. (original) The method of claim 31, wherein said solid support material is selected from a polymer, silicate, aluminate, and combinations thereof.

33. (original) The method of claim 1, wherein said medium is a solid.

34. (original) The method of claim 1, wherein said medium is a solution.

35. (original) The method of claim 34, wherein said solution is disposed on an applicator.

36. (cancelled)

37. (currently amended) The method of claim [[9]] 1, wherein the ~~concentration of said metal ion:alkoxide ion~~ratio is ~~about 0.5 to about 1.5 equivalents of the concentration of the metal ions~~ in a range from 1:0.5 to 1:1.5.

38.- 41. (cancelled)

42. (currently amended) The method of claim 1, wherein said organophosphorus compound is $C_2H_5-O-P(O)(CN)-N(CH_3)_2$ (Tabun or "GA") ~~Tabun (GA).~~

43. (currently amended) The method of claim 1, wherein said organophosphorus compound is $(i\text{-propyl})-O-P(O)(F)CH_3$ (Sarin or "GB") ~~Sarin (GB).~~

44. (currently amended) The method of claim 1, wherein said organophosphorus compound is $(t\text{-butyl})CH(CH_3)-O-P(O)(F)CH_3$ (Soman or "GD") ~~Soman (GD).~~

45. (currently amended) The method of claim 1, wherein said organophosphorus compound is $cyclohexyl-O-P(O)(F)CH_3$ ("GF") ~~(GF).~~

46. (new) The method of claim 24, wherein said organophosphorus compound is a V-agent.

47. (new) The method of claim 1, wherein said neutral organophosphorus compound is a pesticide, insecticide, chemical warfare agent, or nerve agent; and

wherein, through said alcoholysis reaction, said neutral organophosphorus compound is decomposed to a less toxic product.

48. (new) The method of claim 1, wherein said neutral organophosphorus compound comprises at least one leaving group bonded to a phosphorus atom, said leaving group selected from the group consisting of halogens, alkanesulfonates, alkyl sulfates, and p-toluenesulfonates.